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Representing no special interest

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Florida Citrus Crop Hit Hard By The Freeze

On the morning of December 12 Florida was visited by the hardest freeze experienced in many years, some old-timers say the worst since the "big freeze" of 1895. At any rate, the damage sustained by citrus growers was by far the worst in recent years.

With official reading of 27 degrees at Tampa, the mercury ranged as low as 19 or 20 degrees in some isolated sections of the citrus belt, with readings of 22 to 24 quite commonly reported on the morning of December 12. On the following morning a second freeze, only one or two degrees less severe than the first, was felt in practically all sections of the citrus belt. In many instances the freeze of the 13th was even more disastrous than that of the 12th, in view of the fact that many growers had exhausted their fuel supply on the first night and found themselves under the necessity of permitting their groves to go unprotected the second night.

While the damage to the citrus crop was by no means evenly distributed, there was no section of the state in which citrus is grown which entirely escaped. Some growers suffered the loss of their entire crop, while in some rare and favorable instances, the loss to certain growers was apparently negligible.

First reports indicated that while the fruit itself suffered extensively, that there had been little or no damage to trees, but later reports indicate that the trees in some sections also have been materially injured.

Estimates of the loss to the citrus crop vary greatly, but based upon a composite survey of various estimates it seems conservative to say that taking the citrus belt as a whole, the loss to oranges will run not less than 40 per cent, grapefruit at least 25 per cent, and tangerines from 75 to 80 per cent. For the first time in the history of Florida freezes, first estimates seem to have under-estimated rather than over-estimated the damage.

Asked by The Citrus Industry for estimates of the damage to citrus, men in close touch with the situation have submitted their estimates, based upon present information and indications following a careful field survey by the organizations with which they are connected. These estimates are submitted herewith:

FLORIDA CITRUS EXCHANGE
By E. E. Patterson, Salesmanager

It is impossible at this time to make an accurate estimate of the crop damage from the recent freeze. We now have our field representatives busily at work making a complete survey of all citrus sections from which we hope to be able to make a definite and fairly accurate estimate within a few days.

My personal opinion is that the loss will be less than some of the early estimates indicated. I would say that the outside loss on oranges will not exceed 35 per cent. Grapefrom ·25 to 30 per cent damage, while on tangerines the injury will probably amount to 75 to 80 per cent.

This is given as my personal opinion from present available information, but the figures given may be materially changed when reports from our field men now engaged in the survey are at hand.

THE GULF FERTILIZER CO.,
By G. D. Sloan, Sales Manager

The low temperatures on the nights of December 11th and 12th caused more damage to fruit and truck crops than any cold this State has experienced since the 1894-95 freeze, although from present indications wood damage to citrus, except in a few individual cases, has not been as great as was caused by the freeze in 1917. The explanation apparently lies in the fact that for the last several months, throughout the entire citrus area, we have had extremely dry weather together with some rather cold nights, rendering the trees in a very dormant state, whereas in 1917 the trees were in a more thrifty condition and, in a number of instances, actually growing.

Truck crops, with the exception

(Continued on page 20)

1. Agricultural Adjustment Administration
2. Citrus fruits, marketing

Agreement And License For Florida Citrus Industry Now In Effect

A marketing agreement and license for the citrus fruit industry of Florida, intended to improve returns to growers and to correct the present demoralized condition of the citrus markets, was signed on December 14 by Secretary of Agriculture Henry A. Wallace. The license and agreement became effective December 18, at 12:01 a. m.

Returns to growers of citrus fruit in Florida are now below the unfavorable prices of last year, and only slightly above the cost of harvesting and marketing the fruit. The agreement makes it possible for the industry to regulate the unusually large supplies of citrus fruits available for market, through limitation and proration of shipments.

The agreement provides for proration of shipments on the basis of certificates allotted to growers, and for limitation of shipments through regulations governing the grade and size of fruit that may be shipped. The allotments to shippers will be based on the fruit controlled by them, as represented by grower certificates in their possession, or on their past performance record, whichever is higher.

Further provision is made for regulation of shipments to auction markets which recognizes each shipper's performance in the auction markets included in such regulation.

The control committee of thirteen members and their alternates is named in the agreement as follows: Shippers: L. L. Lowry, Tampa; alternate, Frank G. Clark, Indian River City; C. C. Commander, Tampa; alternate, E. E. Patterson, Tampa; W. H. Mouser, Orlando; alternate, J. C. Chase, Winter Park; Charles Stewart, Frostproof; alternate, L. P. Kirkland, Auburndale; L. C. Edwards, Tampa; alternate, W. G. Roe, Winter Haven; Harry L. Askew, Lakeland; alternate J. J. Parrish, Titusville. Growers: George B. Aycrigg, Winter Haven; alternate, H. E. Cornell, Winter Haven; John S. Taylor, Largo; alternate, Marvin Walker, Tampa; Harry L. Borland, Ocala; alternate, E. W. Vickers, Sebastian; Hudson J. McReynolds, Orlando; alternate, A. F. Pickard, Lakeland; I. A. Yarnell, Lake Wales; alternate, James M. Tillman, Lake Wales; A. W. Young, Vero Beach; alternate, William T. Bland, Lake Gem; Francis P. Whitehair, DeLand; alternate, C. E. Stewart, DeLand.

Copies of the agreement and license may be obtained at the office of the Chief Clearing House, Agricultural Adjustment Administration, Washington, D. C.

McReynolds Tenders Resignation

Hudson J. McReynolds of Orlando, around whom much of the opposition to the set-up of the control measure has centered, tendered his resignation immediately following the singing of the marketing agreement by the Secretary of Agriculture. Accepting the resignation with regret, the department of agriculture announced the appointment of Eugene Burrell of Eustis, as McReynolds successor on the control committee.

The control committee met in Orlando on December 18 and organized by seating Mr. Burrell and the election of John S. Taylor as chairman of the committee, succeeding I. A. Yarnell, who served in that capacity last year.

The control committee also voted to move headquarters to Tampa in the interest of economy in the matter of traveling expenses. At a later meeting it was voted to make Winter Haven headquarters for the Committee.

The national stabilization committee, considered of prime importance, was named as follows:

For oranges, L. C. Edwards, Tampa, R. B. Woolfolk, Orlando, C. C. Commander, Tampa, and C. E. Stewart, DeLand.

For grapefruit: John S. Taylor, Charles Stewart, Frostproof, A. W. Young, Vero Beach, and I. A. Yarnell, Lake Wales.

Leslie Brown of Orlando was named temporary secretary of the committee. O. G. Strauss, Orlando, was named manager-treasurer. His compensation will be fixed later.

Francis P. Whitehair, DeLand, was named attorney for the board.

The federal department of agriculture was asked to supplement the state inspection of citrus fruits to protect the industry from the shipment of frozen fruit out of the state. The committee indicated that it might inaugurate a proration on quality to further guard against the shipment of damaged fruit. It also was indicated that a proration on varities might be ordered to prevent over-supplies of certain varieties of oranges being shipped to already over-stocked markets.

The marketing agreement was signed by Secretary of Agriculture Wallace after he had received favorable replies from more than fifty-one per cent of the growers to whom questionnaires had previously been mailed.

"WINDOW" WRAPPERS FOR CITRUS FRUITS

An innovation in fruit wrappers is being used by some shippers of Florida citrus fruits, in the way of a cellophane "window" wrapper which attractively displays the fruit itself while still wrapped.

The wrapper, which is manufactured by the Milprint Products Company, consists of the regular paper wrapper with a cellophane insert carrying the name and emblem of the shipper. As the wrapper is rather expensive, it is usually used only on the top layer of fruit in each box, but the added attractiveness of the fruit is said to more than offset the added cost of the wrap.

The first Florida shippers of citrus fruits to make use of the new wrap were the American Fruit Growers Inc. and the Monarch Orange Co., but the wrapper is being used quite extensively by apple growers of the Northwest.

Harry J. Blakeslee, Florida representative of the manufacturers, states that he anticipates a largely increased use of this window wrapper by citrus shippers next season.

NOTED PLANT AUTHORITY STUDYING FLORIDA FLORA

Among Florida's visitors this week is Dr. John K. Small, of the New York Botanical Gardens, author of the accepted manual of southeastern flora and of a collection of books about the trees, ferns and shrubs of Florida.

After a short conference with H. Harold Hume, Erdman West, and others of the Experiment Station in Gainesville, Dr. Small continued his trip for further study of the flora of subtropical Florida.

Suggestions On Fall And Winter Fertilizing Citrus

By E. F. DE BUSK, Citriculturist

The fall fertilizing, September to November, is the beginning of the direct preparation of the citrus tree for the bloom and setting of fruit the following spring. This application is usually the most important of the three, in making a crop of fruit, because upon this application the tree must depend very largely for its nitrogen in building up in the tree that reserve supply of nitrogen so essential in the production of a vigorous bloom and heavy setting of fruit the following spring.

In making this fall preparation of the tree for the coming crop most efficient, several factors must be taken into consideration. Namely, the present condition of the tree, especially the color of the foliage; the variety and size of the crop of fruit that the tree is carrying; the character of the soil, with particular reference to its leaching qualities; and the amount of nitrogen that has been applied during the summer. Of course, the color of the foliage alone will often suggest the proper course to follow. A yellow foliage may usually be taken as a signal that the nitrogen reserve of the tree, and the available supply in the soil, are both running very low. This condition would suggest the need of an immediate application of quickly available nitrogen to start building up the tree. The same amount of phosphoric acid and potash may be applied in a mixture with the nitrogen or may follow water. The trees cannot make the best use of an application of potash while suffering from a deficiency of nitrogen.

Of course there are other causes of yellow foliage about which a few things have been learned. In cases of frenching, or the type of yellowing associated with the so-called "bronze leaf", mulching under the branches of the trees in addition to the treatment I have just outlined is proving to be a very satisfactory practice. Most any kind of vegetable matter, such as grass, weeds and leaves may be used. It seems that frenching and bronzing are results of deficiencies of secondary or minor plant nutrients in some of our soils, which are either supplied in small quantity from the decomposed organic matter used as a mulch, or the small quantity of these nutrients in the soil is made more available by the changes that take place in the soil resulting from the decomposition of the organic matter applied. In one kind of frenching at least, a deficiency of zinc has been recognized as a cause, and has been supplied by spraying the trees with a zinc sulfate solution. One kind of yellow foliage has been made to turn green in a few field tests by an application of magnesium in the form of dolomite. In other instances an application of raw phosphate has resulted in an improvement of the foliage and tree condition.

I am merely trying to impress the fact that a yellow foliage is not normal. It is the sign of a deficiency of some one or more plant nutrients. A tree with a yellow foliage cannot function normally. If it is carrying a heavy crop of fruit it has given largely of its reserve to the fruit, and if not built up, will be in poor condition to set a crop of fruit next spring. This is the common tree condition that results in alternate light and heavy crops of fruit. It is being corrected to a large degree by beginning earlier in the fall or late summer to build up the tree reserve which normally runs to a very low level during the summer months, especially in trees growing on a light soil deficient in organic matter.

Fertilizing trees that have a normal green foliage at this time, and preparing them for a crop of fruit next year, is not a difficult matter. About 30% of the total annual application of nitrogen should be applied. One to two times as much phosphoric acid or potash may be needed, depending on how much was applied in the summer, and the tree condition. Where trees have been amply supplied with nitrogen during the past year and are in a vigorous condition they can utilize a greater amount of potash this fall and winter. Incidentally they will be more resistant to cold and disease.

Observations on the effect of fall and winter fertilizing on the quality of fruit justify a few suggestions. Mid-season fruit is rendered more firm, and its holding and keeping quality is improved, by fertilizing to maintain a vigorous tree condition during the fall and winter. The quality of a fair to heavy crop of Valencias apparently is not materially affected by ample fertilization in the fall and winter to prepare the trees for the crop to be set the following spring, especially where the MINIMUM FALL AND WINER CULTIVATION IS PRACTICED| On the other hand, light nitrogen fertilizing in the fall and winter, accompanied by deep cultivation, may result in a coarsening of the fruit after growth begins in the spring. The tree that is allowed to go unnourished in the fall and is then given even a light application of available nitrogen about the time new growth starts the following spring, is likely to produce a coarse growth ,and produce it earlier than one that has been uniformly well nourished the previous year. The tree that is properly nourished throughout the year is the one that produces the best quality of both fruit and growth, other conditions being on a comparable basis. A mistake often made in fertilizing Valencias is by light fall fertilizing, resulting in a weak bloom and light setting of fruit. With the light crop of fruit on the tree it is almost impossible to prepare the tree for a new crop without either coarsening the fruit or making it too large. With a heavy crop on the trees at this time, the problem of preparing the trees for a new crop next spring, without affecting the quality of the current crop, largely disappears.

AMERICAN SOCIETY OF AGRONOMY SPONSORS WORK IN RESEARCH

The Executive Committee of the American Society of Agronomy at its recent annual meeting in Washington, D. C., voted to sponsor and administer the Chilean Nitrate Awards for Outstanding Research in the Importance of the Rearer Elements in Agriculture."

These awards, five in number and representing $1,000 each, are open to all agricultural research workers in the United States and its possessions.

The project begins at once and a year from now five awards will be made according to the decision of a special committee appointed by the President of the Society.

That so important a development will greatly interest the research workers of Florida can hardly be questioned, in view of similar far-reaching investigations already completed and under way in this state.

Boosting The Christmas Citrus Trade

HOW ONE CONCERN AIDS RETAILERS IN CREATING NEW DEMAND FOR CITRUS FRUITS

Always alert to aid retailers in expanding the demand for and use of citrus fruits, The American Fruit Growers Inc. last year inaugurated the display of citrus fruits in Christmas gift baskets. So popular did this prove and so greatly did the baskets stimulate trade in retail stores handling the Blue Goose products, that the company again this year used the same promotional methods on an even greater scale and with still greater results in stimulating the sale of citrus products.

The accompanying illustrations give some slight idea of the attractiveness of the gift baskets when properly displayed in the show windows of retail stores, and it is not surprising that the retailers making use of the baskets report greatly increased sales.

Last year the baskets were used by dealers in twenty-one states, whose average increased sales from the use of the baskets amounted to $54.00. The same dealers report that they anticipate even larger increased sales from the use of the baskets this season, basing their estimates upon early inquiries from prospective buyers of Christmas fruit in gift baskets.

In letters to retailers, The American Fruit Growers Inc. stressed the following points which were used to good advantage by retailers in attracting increased sales:

"More people than ever before are looking for a useful gift this year—and if you can offer it to them, you profit. For what is more useful than a beautiful gift basket of fine fresh fruits, that carries at the same time a strong Christmas sentiment.

"You may have thought that this business was cornered by fancy fruiterers, but forget that idea right now! Baskets like these can be made up by any grocer who has a little patience. And remember, the profits can be much higher than on your competitive items. You will be well repaid for the time and effort it takes. Here's what you do—

"FIRST—Make up several baskets as samples to show your customers. Display them. Talk about them. Suggest that many friends would appreciate such a gift.

"SECOND—Hang up these display banners in prominent places—on your door, in your windows, on your trucks, besides your cash register, or any place in your store where the

(Continued on page 20.)

Record Of Frosts In Florida

The Lake Garfield Nurseries at Bartow, has permitted the use of the following data on frost temperatures in the state from 1766 to the present time, in the table submitted below: Prior to 1894 the minimum temperatures given are those recorded at Jacksonville. Later than 1894, temperatures indicated are the official readings at Bartow:

Jan. 3, 1766 — Freeze.
Feb. 8, 1835 — 7°.
Jan. 12, 1886 — 15°
Dec. 29, 1894 — 20°.
Dec. 30, 1894 — 25°.
Feb. 8, 1895 — 22°.
Feb. 9, 1895 — 22°.
Feb. 10, 1895 — 26°.
Feb. 11, 1895 — 32°.
Jan. 2, 1898 — 25°.
Jan. 3, 1898 — 28°.
Jan. 4, 1898 — 27°.
Feb. 9, 1899 — 28°.
Feb. 13, 1899 — 26°.
Feb. 14, 1899 — 22°.
Jan. 14, 1902 — 21°.
Jan. 15, 1902 — 27°.
Jan. 23, 1902 — 31°.
Jan. 5, 1905 — 31°.
Jan. 26, 1905 — 22°.
Jan. 27, 1905 — 20°.
Jan. 28, 1905 — 24°.
Jan. 29, 1905 — 30°.
Dec. 23, 1906 — 24°.
Dec. 24, 1906 — 20°.
Dec. 25. 1906 — 26°.
Dec. 26, 1906 — 28°.
Dec. 27, 1906 — 25°.
Dec. 27, 1909 — 27°.
Dec. 30, 1909 — 25°.
Dec. 31, 1909 — 22°.
Jan. 31, 1909 — 29°.
Feb. 1, 1909 — 25°.
Feb. 4, 1909 — 30°.
Jan. 1, 1910 — 25°.
Feb. 3, 1917 — 25°.
Feb. 4, 1917 — 22°.
Feb. 6, 1917 — 27°.
Feb. 7, 1917 — 29°.
Jan. 4, 1918 — 26°.
Jan. 5, 1918 — 26°.
Jan. 11, 1927 — 30°.
Jan. 12, 1927 — 24°.
Jan. 16, 1927 — 26°.
Jan. 2, 1928 — 36°.
Jan. 3, 1928 — 24°.
Jan. 4, 1928 — 26°.
Dec. 11, 1934 — 34°.
Dec. 12, 1934 — 22°.
Dec. 13, 1934 — 24°.

Florida Citrus Institute To Boost Citrus Sales

Headed by Lorenzo A. Wilson of Jacksonville, extensive grove owner and a leader in Florida business life, the Florida Citrus Institute has been organized with the announced purpose of boosting the sale and price of citrus fruits. Associated with Mr. Wilson are Edward Ball of Jacksonville and Earl W. Brown of DeLand.

The purpose of the institute, it was stated, is "to increase the national and international per capita consumption of Florida citrus fruits."

Mr. Wilson, who has large grove and packing holdings at Davenport and who had been chairman of the Florida World's Fair Commission, announced the organization of the institute and added that the plan already had received the endorsement of three citrus bodies, the Florida Citrus Growers and Shippers Association, the Committee of Fifty, and the Association of Presidents. Later, the Florida Citrus Exchange also gave the institute its endorsement.

"The damage to the Florida citrus crop from the past week's freeze has not in the least lessened the need for a far-reaching program looking toward increasing consumption of Florida oranges, grapefruit and tangerines," Mr. Wilson stated. "Florida has two big crops—citrus and tourists. Due to many efforts including that made through the Florida exhibit at the Chicago World's Fair, the tourist appeal is being satisfactorily met. However, as regards citrus, the rate of consumption has been and is at a standstill in the northern marketing areas in which Florida has a natural advantage. It is time to take steps in behalf of the citrus crop."

The executive committee of the institute will consist of Mr. Wilson, Mr. Ball, Jacksonville banker and vice president and general manager of Almours Securities, Inc., and Mr.

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The Citrus Industry

with which is merged The Citrus Leaf

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CITRUS DAMAGED BY FREEZE

Not for twenty years, possibly not since the "big freeze" of 1895, have the citrus growers of Florida suffered so severely from freezing temperatures as during the nights of December 12 and 13, when practically the entire citrus belt of the state sustained serious loss.

The extent of the damage is still problematical. Many days must elapse before accurate and authoritative estimates can be made. However, it is known that loss to fruit will run into high percentage figures. Fortunately, the damage to trees is apparently slight at this writing, though in some sections of the state reports of trees being split by the frost are being made.

There is, however, in the present situation nothing to blast the hopes of Florida citrus growers. While the loss to individual growers who have lost all or nearly all of their crop, may seem irreparable, the higher price which the remaining uninjured crop will bring, will doubtless result in bringing more money into the state than would have been received for the entire crop without the freeze. This is small consolation to the grower whose loss is total, but mitigates the situation to those who succeeded in saving any considerable percentage of their crop.

The fact that such low temperatures may be expected in Florida only once in twenty to forty years, marks this state as peculiarly fitted for the production of citrus fruits with the minimum of risk.

One element which will mean much to the growers also is seen in the practical extermination of insect pests by the extreme cold, and the consequent lessened necessity for active pest control measures next year.

Assurance that the Federal government will extend financial aid to grove owners to provide for fertilizer and other grove needs will lessen the hardship which otherwise would have attended the freeze.

Florida has been hard hit, but Florida citrus growers have survived even greater losses and built up a magnificent industry. They will survive the present loss and go forward to build a still greater industry.

MARKETING AGREEMENT IN OPERATION

At last the Florida citrus marketing agreement has been signed by the Secretary of Agriculture. The Control Committee has been named and organized, and already the committee is beginning to function.

Coming immediately upon the heels of the recent freeze, the marketing agreement found Florida growers and shippers in the mood to co-operate with the Federal administration in placing the distribution of citrus fruits on a carefully controlled basis under strict government supervision.

Surface indications are that the varied and conflicting interests in the industry in the state are now more nearly united in support of the agreement and in general harmony with the committee as at present constituted than at any time since the marketing agreement was first proposed—certainly more so than since the termination of last year's agreement and the submission of the proposed new agreement by Federal authorities.

Much may be expected from the operation of the marketing agreement if it is given united support of the industry—a support which now seems to be forthcoming.

BANS SHIPMENT OF FROZEN FRUIT

The action of Commissioner of Agriculture Mayo in promptly placing a ban on the shipment of frozen or damaged fruit following the recent freeze is to be commended. Two much care cannot be taken in seeing that the ban is made effective.

The shipment of even a few cars of frozen fruit to Northern markets would do more to demoralize those markets than the later shipment of a thousand cars of good fruit could overcome. This condition is recognized by the recently organized Control Committee, which evidently will give its full backing to the Commissioner of Agriculture, and will probably go even farther by asking the Federal department to join the state officials in enforcing the ban.

Florida growers have already suffered sufficiently from the freeze. They will now need every possible protection which can be extended by the Control Committee, the state officials and Federal department of agriculture.

"Let not one frozen fruit leave the grove," should be the slogan of every citrus grower, every citrus shipper and every well-wisher of the state.

Because your fruit has been damaged, your trees possibly injured by the cold, is no reason for neglecting your grove. Indeed, your grove will need and should have even greater care than usual to build it up to normal condition for the production of future crops.

IMPRESSIONS

By Frank Kay Anderson

One of the most spendthrift and extravagant persons we know of is the ironical gentleman who wasted a three cent stamp upon a letter to us from Chicago . . . congratulating us upon the election of that Democratic negro congressman there . . . And death has ended eighteen years of work with the College of Agriculture at the University for Dr. J. E. Turlington . . . who, as recorded here some time ago, had been given a year's leave of absence because of ill health . . . a fine chap, Dr. J. Ed. Turlington, and one who certainly knew how to handle his figures . . . The New Yorker, that metropolitan weekly of caustic comment, tearing its shirt all to bits concerning "arsenated" Florida oranges and grapefruit . . . Governor Dave Sholtz making a splendid effort to set them right . . . but as well try to put out a prairie fire with a garden hose . . . and they've gotten the Consumers Research Bureau, whatever that is, stirred up too . . . Pity they don't devote their attention to some of their sprayed Long Island garden produce first, before they go so far afield . . . However, it is what we predicted a long time back . . . when folks began freely to throw that word "arsenic" back and forth here in Florida . . . remember, we advocated the phrase, "spray to induce early maturiity." . . .and leaving that nasty word unsaid. . .Does seem hard lines though that of all publications The New Yorker should be initiating this publicity . . . when it was that publication which was awarded the only sizable advertisements that were run during last winter's Florida grapefruit compaign . . . R. D. (Dick) Pope of Winter Haven strongly favoring the proposed Sanford-Tampa barge canal . . . which is wholly natural . . . the daddy of motor boating in Florida probably would like to be able to do his visiting about the state over water routes . . . If you have a pet canal project and want it endorsed to Washington, drop a line to Dick Pope . . . Next to selling James crates, nothing gives him more pleasure than boosting a canal . . . That Brevard County race for county commissioner we mentioned last month between those two well known East Coast growers, Frank G. Clark of Indian River City and Ward C. Klingensmith of Titusville, running respectively upon the Republican and Democratic tickets, had a truly hair raising finish . . . Seldom were the candidates more than two votes apart on the count . . . then the count finished with Frank Clark one vote ahead . . . but some absentee ballots still to come in . . . then counting the absentee ballots, and Ward Klingensmith the winner . . . which in part deprives the Hon. Frank Clark of the distinction of being Florida's sole surviving active Republican . . . What's this? . . . A photograph of W. B. (Bill) Goding of Apopka in the newspaper . . . the hardihood of editors . . . named to take the place of the late William Edwards upon the board of directors of the State Bank of Apopka . . . upon which R. T. (Bob) Carleton of the Plymouth Citrus Growers Assn. also sits . . . W. G. Talton, who had been cashier of the bank ever since Hector was a very small dog, named to be president in Billy Edwards place . . . Our personal thanks to Earl W. Brown of De Land, George Clements of Bartow and the other fellows connected with the Florida exhibit at Chicago for the donation of flowers and plants to the Hines Veterans Hospital outside Chicago, upon the close of the exhibit, which they made at the intercession of our wife . . . out at Hines the greenhouses have been built up and are operated by the mental cases wholly from donated material . . . giving those boys something to work with and think about is truly a kindness . . . The Hines Veterans and U. S. Marine hospitals were well remembered . . . Florida fish and native rock went to the great Shedd aquarium in Chicago . . . Northwestern university and two Chicago high schools which maintain horticultural departments obtained donations . . . a famous X-ray researcher got the bitter aloes plants for use in his study of X-ray burns . . . some subtropical plants went to the South Bend, Indiana, municipal park . . . Scientific material was divided between John B. Stetson University at DeLand and and the University of Michigan . . . and some flowers and plants went to the Miami-Florida display which will be maintained in a Chicago loop building this fall and early winter . . . and for the men and women who worked so hard to make Florida's exhibit a success, including Lorenzo A. Wilson of Jacksonville who labored so dilligently to aid its financing the second season, let us quote from the Chicago Tribune, after the official closing of the Century of Progress, the following: . . . "Now that it can be told, Florida led all the states in the Hall of States section of the exposition. It took the lead in the 1933 fair, and came back for the encore presentation with added features which cost $40,000.' . . . So let's give credit where credit is due . . . On the V. E. Shelton place near Cocoa recently a large hawk and a Japanese silky rooster battled to the death . . . no one saw the fight, but Mr. Shelton found both birds dead in his chicken yard with every evidence that they had fought it out . . . Frank Allen, well known citrus grower and mercantile man of Orlando has passed away suddenly following an emergency operation . . . Son of the late Hugh C. Allen, widely known in citrus circles, Frank Allen derived his greatest pleasure from the care of his groves . . . with his brother Ed. H. Allen, he was owner of the Allen Picking Bag Co., of Orlando . . . which concern established by their father many years ago has furnished picking bags to practically every citrus growing area over the globe . . . Born in Orange County 39 years ago, Frank Allen had a wide circle of friends who valued him for his quiet sincerity and substantial qualities . . . Passing through Orlando and we pause to do an errand; and whom do we meet within a few feet but K. L. (Kingsley) Smith of Los Angeles . . . of the old Electric Fruit Marking Co., and co-developer with Frank Ahlburg of that device which has done so much to revolutionize the marketing of some fruits . . . particularly citrus fruits . . . though while the pair were working on it during those long winter nights in Alaska they thought they were pro-

ducing a machine to trademark apples . . . In the early days of electric marking machines in Florida Kingsley Smith spent a lot of time here . . . made a lot of friends . . . and, incidentally, kept us busy at times keeping him out of jail . . . he thought roads were made to travel on, so he traveled . . . and at too fast a pace to suit the traffic patrols . . . finally arresting him got to be a sort of habit . . . Evidently he hasn't slowed up unduly with the passage of years . . . He and the young chap with him had just pulled into Orlando by auto from Los Angeles . . . in just three and one-half hours short of four days from the time of their start . . . though they insisted they hadn't driven later than midnight any night . . . Well, an average of fifty miles an hour across the continent isn't at all bad . . . not even for Kingsley Smith . . . Since Frank Ahlburg sold out the electric marking machine device entirely, he is manufacturing other things now . . . including the new electric fruit counters which many packing houses are installing . . . We kind of wish he had come along with his hustling pair . . . And we thought that frost-insurance on Florida citrus fruits had its real beginning, after some preliminary discussion, in 1919-20 . . . when the Hartford companies put some rather experimental policies upon a selected number of risks . . . mentioning that recently to S. O. Chase of Sandford, he walked over to a safe and took out a paper . . . it was the charter for the first frost-insurance company to be formed in Florida . . . formed by J. C. and S. O. Chase and associates . . . and the date of the charter from the State of Florida was 1886 . . . just 48 years ago . . . S. O. Chase and his safe make us marvel . . . In most offices someone asks for a copy of the letter written to Smith last week . . . there is considerable running around and opening of filing cabinets . . . then after a few consultations they begin to lay the contents of filing cabinets out on the floor . . . On the average it is a good sure even money bet that Smith's letter, any Smith's, will not be found . . . That is modern filing, as it has been developed and perfected since we were an office boy . . . However, S. O. Chase can walk over to that safe and lay hands upon some document from twenty to fifty years old in as many seconds . . . Death has taken Mr. Lawrence Roberts of Winter Park at 73 . . . for fifty years a figure in citrus affairs in Orange and Volusia counties . . . Coming to Florida from Massachusetts in 1883, he settled near Orange City, and developed fine citrus properties there . . . later transferring his activities to Orange County, and during past years living in Winter Park . . . a quiet and most respected citizen, he combined a rare knowledge of citriculture with that ripe judgment which results only from long experience . . . Carl Tobey's slogan for W. B. (Bill) Goding's office at Zellwood: . . . "Humus come up and see us sometime." . . . A. E. Pickard, the well known Orlando grower, tells us the first newspaper guesses as to the incendiary origin of the fire which recently destroyed the new packing house at Ocoee erected by himself and A. E. Davenport of Chicago and Orlando probably were wrong . . . the old case of giving a dog a bad name . . . for Ocoee had had bad luck with citrus packing houses earlier . . . in this case they incline to the belief that maybe explosion of a stove in a coloring room started the blaze . . . By the way A. E. Davenport of Avalon Groves, Orlando, and A. R. Davenport of Gentile Brothers, Orlando, aren't even related . . . Orlando Kiwanis club is making regular weekly shipments of donated oranges to those famous Canadian quintuplets. . .Arnold Mickler of Orlando showed us the special printed label they are using on the boxes, and it is quite attractive . . . Credit Dr. C. D. Christ of Orlando with inventing a method of making Epsom salts downable . . . a teaspoonful in half a glass of HOT orange juice . . . it doesn't improve the orange juice but is reported to make the salts considerably less repugnant to the human system . . . Herman Siewert of Winter Park, who is having some trouble with his eyes, sends word he wishes we'd use ordinary paragraphs instead of this style . . . thinks it would be easier on the eyes . . . Yeah; but we get more into a page this way . . . Sorry things broke so we did not connect with E. A. Street of the California Citrograph and his party while they were in Florida recently . . . We have been reading Mr. Street in The Citrograph for so long we almost feel as if we know him . . . and we do appreciate the compliment of being quoted so often in his most excellent journal . . . Incidentally we wanted the chance to take him out to one of the two orange-winneries near Orlando for a demonstration . . . for another writer in The Citrograph not so long ago took us to task upon the subject of orange wine . . . he quoted one of the authorities of the Orange Products Co. of California, manufacturing subsidiary of the California Fruit Growers Exchange, to the effect that there was nothing to the orange wine idea . . . that oranges naturally fermented produced a wine with a maximum of only six per cent alcoholic content . . . We'd have liked to have slipped a few glasses of the naturally fermented fourteen-percent-alcohol Florida product under Mr. Street's belt . . . and watched for the reaction . . . And that reminds us that Fred E. Parks of Orlando recently allowed us to sample some Florida orange brandy . . . Now our personal knowledge of wines only runs from van rooge to cognac, and back . . . but if this Florida orange brandy wasn't a twin for Mr. Hennessy's well known three-star brandy, we don't know a thing . . . It would take Hennessy, or maybe Mrs. Hennessy, to tell 'em apart, in our opinion . . . Hard luck recently was the lot of Frank Hammett of Orlando, former public relations man for the late lamented Florida Citrus Control Committee . . . Being over in St. Petersburg, and being a former Tampan, he decided to perpetrate a little philanthropy while time was hanging on his hands . . . so he picked out a consumptive little guy, who looked as if he might hail from Oskaloosa, Ioway, and opened up on him . . . to sell him the Gandy bridge . . . it certainly was tough luck that he opened up on the very guy who owned the bridge . . . having just bought it three weeks before . . . and even tougher that Frank had to slip him a ten dollar bill to keep him from calling the cops . . . W. W. Yothers, of the federal experiment station at Orlando, sorting and counting "bugs" . . . and we visit over the difficulties which some owners of citrus properties seem to have in distinguishing the various pests whose board and room costs the growers so much . . . and reach the conclusion that part of the difficulty is due to so many persons becoming owners of orange groves after they have reached an age when they are no longer studiously inclined . . . He tells us, incidentally, that teaching a man past fifty to distinguish a rust mite is extremely difficult, sometimes impossible . . . yet very small children learn

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After Drouth Treatment Of Citrus

Extension Citriculturist Outlines Plans For Period Following Dry Weather

By JEFFERSON THOMAS

Florida failed to escape a measure of damage from the abnormal weather conditions that prevailed during 1934. In the spring and early summer most parts of the state, including the greater portion of the citrus belt, had rains ranging from ample to excessive in volume. November and the first half of December brought drouth over a widespread area, which was especially severe in several of the principal grapefruit and orange producing sections.

When dry weather continues through a lengthy period, the injury to agriculture frequently is of larger proportions in the future reactions than it is from immediate losses. Citrus groves of Florida in particular are susceptible to the after effects of drouth. Growers find themselves confronted by new and puzzling problems as the rains come again following an absence extending over weeks and even months.

In anticipation of the situation that must be met in overcoming the ill-consequences from the shortage of rainfall during the latter part of 1934, E. F. DeBusk, citriculturist of the State Agricultural Extension Service was asked to furnish, for the benefit of The Citrus Industry readers, an outline of the treatments which experience has indicated as most helpful in regarding the ravages of drouths that affect groves.

On his travels through citrus Florida in the past few weeks, Mr. DeBusk has had opportunity for observing closely thousands of acres in groves. Dropping of the fruit was found to be heavy wherever artificial means of supplying moisture were lacking. Irrigation would have prevented the bulk of this loss, he points out, and more growers than ever before are considering the installation of systems.

Tree injury also has been disclosed in a great many of the groves which Mr. DeBusk visited. Conditions of weakness, directly due to the drouth, will increase the tendency to infections of deplodia, melanose and withertip. If the weather at the time favors the development of melanose, a severe outbreak next spring is likely.

What Can Be Done For Trees

"Groves that have suffered from drouth and which cannot be irrigated should receive special attention in supply of plant food immediately available, when rain arrives," Mr. DeBusk said. "In this way alone the greatly depleted reserves of nitrogen in the trees can be built up again. Applications of the fertilizers for this purpose must be given before the blooming season if good crops are to be expected.

"In the period of continuing drouth, the trees have been unable to take up much plant food from the soil. Reserve supplies they were carrying consequently have been greatly reduced. Replacing these accumulations will be impossible without water in the ground. If soluble nitrogen is applied, it will be absorbed when necessary moisture in the soil is restored.

"Root systems that are active push downward during dry weather, in search of moisture. They have gone as far as two to four feet beneath the surface in the past few weeks, and in some instances to even greater depths. With the soil almost air-dry from three to five feet down, a large amount of water will be needed to overcome the scarcity.

"When the moisture on which the trees normally feed has again become sufficient for their needs, plant food, especially nitrogen, should be distributed throughout the area occupied by the roots. Taken up immediately as it then will be, the material will proceed to rebuild the reserves of the trees, so much needed.

"If only small amounts are given, of slowly soluble nitrogen, the requirements of the trees cannot be supplied as quickly. They must have ample reserves before bloom time comes. In cases of deficiency, crop yields will be lessened.

"Trees apparently are unable to avail themselves from the soil of all the nitrogen they require during the periods of blooming and early spring flush of growth. Hence the necessity of reserves within themselves.

Things It Is Better Not To Do

"Spraying of citrus trees with oil while they remain in a state of shock from the drouth is undesirable. The applications will cause further disturbance of the system, increasing the danger of injury from cold in the event of low temperatures. Unless scale infestations are visibly weakening the trees, putting on the sprays had best be postponed until they are stronger and more able to withstand shocks.

"Where trees have lost wood in considerable quantities, as the result of drouth, pruning needs thoughtful handling. If the injury has been enough to prevent any sizeable crops in the following spring, it will be wise not to prune until spring growth has ceased. When output is sought, however, removal of dead wood is proper practise.

"Ridding the trees of the dead growth will remove much of the sources from which melanose otherwise will spread. As a safeguard against infections if spring weather favors the disease, pruning is advisable under the conditions I have mentioned.

"Organic matter in plentiful quantities is another form of assistance to the root systems in their struggle for recovery from drouth damage. Trees that obviously have been injured should by all means have the material in bulky form.

"Whatever is selected for supplying the organic matter, applying the material under the branches of the trees, with ample amounts of fertilizer over it will assure restoration more quickly of injured root systems," Mr. DeBusk concluded.

In discussing drouth conditions with Florida Agricultural Experiment Station workers whose duties pertain to citrus affairs, no little fear of persisting tree weakness manifested itself as prevalent among them.

Groves maintained at the main station and several of the branches are to be kept under close scrutiny for evidences of unusual factors that the dry weather may have influenced.

Citrus growers who detect indications of diseases or pests they are unfamiliar with will be promptly answered when writing the Experiment Station for information.

County farm agents in the fruit growing localities also will be found fully alive to the problems that drouth has intensified.

(While the foregoing article had been prepared previous to the occurrence of the recent freezes in Florida, the conditions created thereby do not necessarily change the situation with reference to the needs of trees that also have suffered from drouth, according to advices from the

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Cover Crops And The Turnover Of Plant Nutrients In The Soil

R. M. BARNETT, Chemist and H. W. JONES, Assistant Chemist, Florida Agricultural Experiment Station

An adequate summer cover crop has been generally recognized as a necessary part of an economical system of soil management for citrus groves. Making their maximum growth during the rainy season, many advantages are attributed to the growing summer cover crops and to their decomposition in the soil. Some of the advantages of a summer cover crop have been emphasized so thoroughly and often to citrus growers that they have become generally accepted. However, there is one role of the cover crop which is not commonly considered by the citrus grower; namely, the part which it plays in the turnover of the mineral nutrients in the soil. The absorption of mineral plant nutrients from the soil by the summer cover crop and the subsequent freeing of these nutrients for the growing citrus tree through the decomposition of the cover crop is of considerable value in the economical management of groves.

Among the many plants used as summer cover crops, Natal grass, Crotalaria striata and Crotalaria spectabilis probably are used on the tal grass and Crotalaria striata are especially adapted to the lighter especially adapted to the lighter sandy soil types.

To obtain specific information about the part played by summer cover crops in making available mineral nutrients of citrus soils, a series of simple tests were conducted in soil tanks (lysimeters) at the Experiment Station. Mature Natal grass and Crotalaria striata were cut into about four inch pieces and either incorporated with the surface soil or used as a mulch on top of the soil. The soil used was a Norfolk medium fine sand. Twenty inches of the soil were placed in galvanized containers with a provision for catching the leachings. Duplicate sets of the cultures were established and one series was planted to rough lemon seedings. The other was unplanted. All cultures were kept in the open.

Analyses were made of the original cover crop materials, the leachings and the soil. The cover crops were allowed to decompose for 18 months. At the close of the experiment, the soil was screened through a 2 mm round holed sieve and the residues of the cover crop were separated from the soil, charcoal and trash. These residues were thoroughly washed, dried, weighed and analyzed. The analytical results on plant materials were all calculated to a sand-free basis.

The mature Crotalaria striata used in this study contained 1.328% nitrogen (N), 1.119% phosphoric acid (P_2O_5,) 0.35% potash (K_2O) and 1.062% lime (CaO) on the air-dried basis. A seven-year average yield of Crotalaria striata at the Citrus Experiment Station at Lake Alfred was 4,900 lbs. on air-dried top growth per acre. Thus in a good cover crop of Crotalaria striata there would be contained 65.1 lbs. of nitrogen, 54.8 lbs. of phosphoric acid, 17.5 lbs. of potash and 52.0 lbs. of lime per acre.

The mature Natal grass used in this study contained 0.749% nitrogen, 0.486% phosphoric acid, 0.977% potash and 0.474% lime, on the air-dried basis. A seven-year average Natal grass at Lake Alfred has been 3400 lbs. of air-dried top growth per acre. Thus a good cover crop of Natal grass contains 25.5 lbs. of nitrogen, 16.5 lbs. of phosphoric acid, 29.8 lbs. of potash and 16.1 lbs. of lime per acre.

It may be called to mind that oranges and grapefruit grown in the Ridge section contain about 12 lbs. of nitrogen, 4 lbs. of phosphoric acid, 22.6 lbs. of potash and 8 lbs. of lime per 100 crates (80 lbs. average weight) which is the approximate average yield per acre for the State.

The analyses of the residues of the cover crops after eighteen months of decomposition serve as a basis of calculating how much of the cover crop had decayed and what part of the mineral nutrients had been made available. These data show that 87.6% of the incorporated crotalaria had disappeared, while only 72.2% of the mulched crotalaria had decayed. The Natal grass showed a loss of 95.9% dry matter when incorporated with the soil and 74.9% when used as a mulch.

Through composition processes of the Crotalaria striata in the soil, 82.5% of the nitrogen, 93.5% of the phosphoric acid, 96.2% of the potash and 75% of the lime contained in the cover crop were freed and rendered available. Using Crotalaria striata as a mulch decreased these figures to 63.1% of the nitrogen, 88.6% of the phosphoric acid, 90.8% of the potash and 51.2% of the lime during the eighteen months' decomposition period.

During the same decomposition period Natal grass gave up 91.6% of its nitrogen when incorporated with the soil. There was not sufficient residual material for other analyses. The mulched Natal grass set free 36.6%. of nitrogen, 47.5% of its phosphoric acid and 96.1% of its potash. From these results it may be concluded that the summer cover crops may play a significant role in the mineral nutrition of citrus trees.

Analyses of leachings from the soil tanks in which the summer cover crops were decaying showed that the mineral nutrients were gradually freed from the crops over the entire period of decomposition. This gradual release of the essential mineral nutrients insures a higher concentration in the soil solution over the period of decomposition. The results obtained with the release of potash from the cover crops were especially

striking. Very significantly higher concentrations of potash were found in the leachings from soils to which cover crops had been added. Analyses of the leachings from the tanks where the rough lemon seedlings were growing showed that the nitrates and potash set free from the cover crops for the most part were taken up by the seedlings. These relatively simple experiments furnish abundant evidence of the value of the mineral nutrients contained in a cover crop for the nutrition of the citrus tree.

A discussion of the mineral nutrients found in summer cover crops and other sources of rough organic matter used in citrus groves will not be complete without some mention of the minor or less abundant elements. Unfortunately information on the content of these minor elements in the commonly used summer cover crops of Florida is very meager. However, Miss Brenchly emphasizes the general distribution of copper, zinc, arsenic, boron and manganese in plant life in her very valuable little book, "Inorganic Plant Poisons and Stimulants" (Cambridge University Press, Fetter Lane, London, or The Macmillan Co., New York). Miss Brenchly has summarized the information available up until 1927. Plants were found to vary very widely in their content of these less abundant elements. McHargue has given intensive study to the distribution of the minor elements in cultivated and indigenous plants of Kentucky. He has found a number of these elements present in varying amounts in plants.

In Florida, various types of rough organic materials such as weeds, grasses, litter from the woods, etc., are sometimes hauled into the citrus groves with beneficial results. That a part of their beneficial action may be attributed to the presence of some of the minor elements in these plants is suggested by an experiment conducted on the Florida Experiment Station farm. In this experiment a very small application of chemically pure zinc sulphate was found to correct a physiological disturbance of corn known as "white bud". Among a number of materials tested, leaf mold from a mixed pine and hardwood hammock was used. The soil treated with a 2½ ton broadcast application of this leafmold produced healthy plants in a field which otherwise produced "white bud" corn. Ashes of the leafmold in spectroscopic tests showed the presence of considerable quantities of zinc.

To what extent the commonly grown summer cover crops would resemble leafmold in their action is not at once apparent. However, it is reasonable to assume that the cover crops would vary in their content of the minor elements with the plant and with the soil type and fertilization for any season. A study of these factors would be desirable and valuable for the citrus grower. On the basis of the studies on the mineral nutrients reported here, it is logical to assume that the cover crops may play a role in rendering available these minor elements if the elements are taken up by the plants used as cover crops.

IMPRESSIONS

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the trick in short order . . . Our talk induces us to reflect that perhaps if we had a compulsory spraying law, like California . . . and all growers had to "put out" for spraying . . . the interest might be more intensive and intelligent . . . If many growers wonder why they did not get an opportunity to vote for or against the proposed Citrus Agreement right recently, it is likely because of non-delivery of the material mailed from Washington . . . but do not blame the Postoffice department . . . Washington mailed its envelopes addressed to grove owners at the location of their groves, rather than to their postoffice addresses . . . and about one-quarter or more of Florida citrus growers do not live upon their groves . . . Odette Booth, 81, died recently at his home at Safety Harbor . . . on the site of his birthplace there . . . born shortly after the Seminole wars, he was the first white child to be born upon the Pinellas peninsula . . . beginning with his father who came to Florida from England, the name of Booth has been associated with citrus groves in Pinellas county since its early beginnings . . . Prof. H. Harold Hume at the Experiment Station is boosting for the cattle feeds made from cull oranges and grapefruit, and the waste from the citrus canning plants . . . Which reminds us again to say that from now on during the dry weather of winter dropped oranges and grapefruit, split with a hatchet, make the best kind of "green" feed for the poultry flock . . . W. A. (Billy) Leffler of Chase & Co. made Sanford such a good mayor this last term that he was unopposed for re-election as city commissioner recently . . . Florida citrus canners, whose pack during the past two seasons has hovered just below the three-million-case mark, this season expected to top that mark a bit . . . a case of 24 No. 2 cans roughly represents a field box of fresh fruit . . . And that estimate of 9,000 carloads of grapefruit to come out of Texas this season persists in print . . . meanwhile Impressions' own under cover operative, now holding down Number 2 chair in the De Luxe barber shop at Mercedes, insists the Texas crop will be nearer 12,000 carloads . . . Returning from one of our little journeys, and here is a familiar and favorite face looking at us out of the evening's Tampa Times . . . Miss Carol Lyons daughter of Mr. and Mrs. C. W. Lyons of Tampa, in the act of becoming Mrs. Frederic S. Jahn of Washington . . . golly, we are getting along in years even if we don't feel that way . . . why, it seems only about day-before-yesterday we drove in a howling storm all one afternoon to bring Carol and our own daughter home from a camp over on the West Coast . . . because two little girls had had a violent attack of nostalgia . . . which in the very best Tampa circles is called home-sickness . . . And that extremely fine looking young woman, whom the society reporter calls "regal" is none other than Miss Marie Lyons . . . Well! Well! . . . "Park your pony out in the back yard, Marie, the kids are out behind the garage." . . . The world do move . . . and none are privileged to stand still . . . So this will be about as good place as any to terminate this month's sermon . . . for we have a matter of some importance which requires personal attention . . . We'll put this into the mail to Tampa . . . and . . . and then . . . we'll drive into Winter Park to meet the afternoon train . . . to greet the arrival from Boston . . . of Kay Miller Yeuell . . . age six months . . . weight twenty-three pounds, washed . . . our grandson . . . Now, it's your turn to brag . . .

Certain Soil Deficiences And Their Corrections

R. M. BARNETTE, Chemist Florida Experiment Station

The study of the effects of the less abundant elements or minor elements on plant growth has been pursued for many years. However, within the past decade the changes in fertilizer practices, the opening up of formerly unused lands such as the Everglades, and other factors, have focused attention on the application of these studies to economical crop production and to an extension of the scientific aspects of the subject.

In this connection, the research work of the Florida Agricultural Experiment Station is of particular interest to the Florida growers and farmers. It is only necessary to call attention to several very practical applications of the findings of the Station to emphasize the importance of experimentation in this very promising field. Some of these are, the use of copper sulphate or bluestone as developed by Drs. Allison, Bryan and others for the improvement of the Everglade soils; the use of maganese sulphate instead of animal manures on the marl soils as studied by Drs. Skinner and Ruprecht, and by Dr. Allison for the burned over Everglades soils.

More recently Mr. Mowry and Dr. Camp have studied the "bronzing" of tung oil trees and discovered that relatively small applications of zinc sulphate corrected this physiological disturbance of the tung nut tree. Dr. Camp has extended the use of zinc sulphate to the treatment of some types of "frenching" of citrus with very outstanding favorable results. In addition, the experimental results obtained with the use of zinc sulphate on field crops as just reviewed by Mr. Stokes are promising to the general farmer whose land produces "white bud" of corn. In these studies, very pure chemical compounds of the minor elements have been used, and their action under the conditions appears to be specific.

In this connection, the layman should be warned against drawing sweeping conclusions from the favorable results obtained from the use of impure salts of these minor elements. Sometimes the compound responsible for the favorable growth of an impure salt on plant growth may be an impurity, and thus lead to an error regarding the action of the chief compound on plant growth. Scientists themselves have made this mistake and beclouded for years the recognition of a specific plant response to compounds of certain minor elements. Another troublesome problem is the role of the soil in the development of these so-called "deficiencies" of minor elements to plant life. There are several theories developed among the research workers covering these deficiencies in their broader sense.

A "deficiency" in the broader sense of the word may be defined as an "inadequacy, want, failure, imperfection, shortcoming or defect." In the broader sense, there are several theories covering the specific action of compounds of the minor elements on plant growth, and of the physiological disturbances of plant growth attendant to their absence or unavailability in the soil.

A short discussion of some of these theories will convince you of the diversity of opinions arising from the experimental evidence and of the complexity of the study of soil de-

ficiencies. For instance, Mr. Javillier made a study of the effect of zinc compounds on plant growth in the laboratories of the Pasteur Institute and in the field. In 1912 he reported some very large increases in the growth of the corn plant in fields due to the application of zinc compounds. He called compounds of such minor elements as zinc, copper, etc., "catalytic or complementary fertilizers." A "catalyst" to a chemist is a substance which speeds up a chemical action without actually taking part in the action. Thus Javillier imagined that compounds of these minor elements speeded up plant growth.

Miss Brenchley has studied the action of compounds of boron, zinc and copper on plant growth for a number of years in the laboratories of the world famous old Rothamsted Experiment Station. Miss Brenchley uses pure chemicals and very pure water to grow her plants. She found that certain of these compounds "stimulated" plant growth. Evidently this "stimulation" implies an acceleration of the growth process due to the presence of the specific compounds.

Using exceedingly carefully purified nutrient salts, water, vessels and in some instances even air for growing plants, Mr. Maze in France, and Miss Sommer in the United States arrived at a different conclusion. They maintain that compounds of zinc, boron, etc., are absolutely "essential" to the healthy growth of certain plants. In other words, some source of these minor elements must be available to some plants in order to insure their healthy growth.

Another interesting speculation on the specific action of the compounds of these less abundant elements, has been set forth by Mr. Smith of Holland and Messrs. Chandler, Hoagland and Hibbard of California. These research workers suggest on the basis of their experimental evidence that plant toxins are formed under certain soil conditions. Compounds of certain of the minor elements, more specifically copper, maganese and zinc overcome the deleterious action of these plant poisons.

Regardless of the theory or theories of the action of the minor elements, which are applicable under a given set of soil conditions, there are only two general soil conditions which may bring about a deficiency of these elements. Either the soil does not contain sufficient quantities of these elements for healthy plant growth, or if the elements are present in sufficient quantities, they are or have been made available to the plant by fixation process or system of management. With these two controlling factors in mind, it is at once apparent that there may be a great variation in the response of different plants to various soils insofar as minor elements are concerned. Without doubt the many different plant species vary widely in their requirements for these elements, and at the same time the many complex dynamic processes which take place in the soil must bring about a relatively wide variability in the availability of these elements to the growing plant.

When the deficiency causing any particular physiological disturbance of a plant has been ferreted out by careful experimentation, the correction is usually relatively simple from a practical standpoint. Compounds of the specific minor elements may be added in available form, usually inorganic salts, liberal applications of animal manures and organic nitrogenous fertilizers carrying the element may be used, or the soil management system may be changed. These are enough examples of the beneficial effects of the application of inorganic salts of certain minor elements in the correction of soil deficiencies to abundantly prove their worth. That a part of the beneficial effects and popularity of animal manures and crude organic nitrogenous carriers is to be attributed to their content of compounds of the minor elements is now being fully recognized. Without doubt, the prevalence of many physiological disturbances of cultivated plants during the past decade has been partly due to a decrease in the supply of these organic carriers of the minor elements.

An interesting case of the effect of soil management on the mobilization of zinc compounds for a growing crop may be found in the old Florida practice of "resting" the land. "Resting" the land or allowing it to grow up undisturbed to native weeds and grasses has proved to be a relatively effective means of decreasing the percentage of "white bud" corn in an otherwise severely affected field.

It remains for the research worker to ferret out these many deficiencies, to attempt their correction by economical means and to diligently study their causes and corrections. Only on the basis of such research may a full understanding of intricate soil deficiencies in minor elements be obtained.

The production of crops and livestock today requires genuine intelligence and skill, constant alertness, and diligent labor.

AFTER DROUTH TREATMENT OF CITRUS

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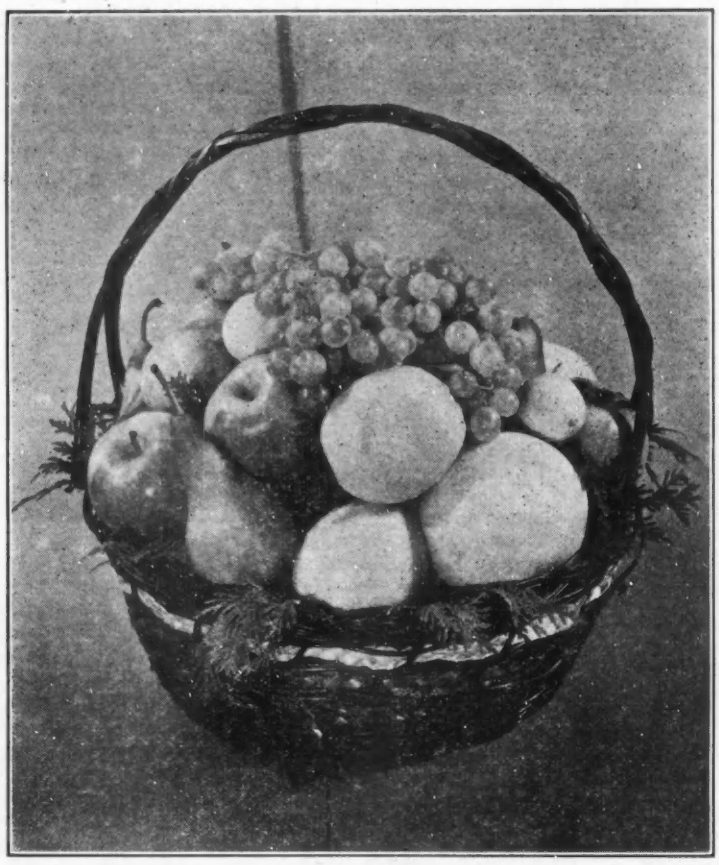
specialists in the state farm services located at Gainesville.

Pruning need not be done at once, H. Harold Hume said. Delay is advised in respect to this job, pending developments, since at present difficulty may be experienced in determining the quantity of dead wood that should be removed. Extent of the damage in this respect may not be fully known until four of five months hence, he explained, and cutting off all the killed branches at one operation is good practice.

Fertilizers applied in the fall will be sufficient until rains have come, is Mr. Hume's opinion. So long as the soil is lacking in moisture the trees can absorb but little plant food from it. When rainfall has taken place, however, the supply of ample quantities should be promptly looked after. Groves will then require plenty of material on which to feed, as they will be suffering from both drouth and cold injuries that have lessened tree vigor.)

Mineral content of Florida truck crops is as high as that of crops grown elsewhere, the Agricultural Experiment Station has found.



BOOSTING THE CHRISTMAS CITRUS TRADE

(Continued from page 8.)

most people will see them. And if you want more, write us immediately before our limited supply is exhausted.

"THIRD—Take as many orders in advance as you can. Then you'll be able to place your orders several days before Christmas for all the fresh fruits you'll need. You can arrange to deliver these Christmas baskets—or for your customers to come and get them. Take deposits in advance for as many as you can.

"FOURTH—You have a chance for profits also if you can get in touch with business firms who give a great many Christmas Gifts, and sell them the idea of giving Christmas Gift Baskets of Fruit. Some companies give as high as 50 to 100 such gifts at Christmas time—some give even more."

FLORIDA CITRUS CROP HARD HIT BY FREEZE

(Continued from page 5)

of cabbage, celery and strawberries, are almost a total loss. There are a few exceptions, of course, in isolated spots where small plantings of peppers came through and a few others where potatoes or beans were just coming through the ground. Even celery in some sections was apparently considerably damaged. It is going to be rather difficult to tell to just what extent it is damaged, in some instances, until marketing time because it is predicted that low temperatures will cause a great quantity of it to go to seed which otherwise would have been good quality. Strawberries were damaged considerably, with a total loss of bloom and fruit, and in a number of cases the bud of the plant was badly damaged. No doubt this crop will be delayed from six weeks to two months and the yield materially reduced.

The citrus industry, of course, was effected to a much less degree than the truck industry. Estimates of loss to the total crop, compiled through personal inspections, by men qualified to make such inspections, on the 14th, 15th and 16th of this month, show damage according to varieties substantially as follows:

Grapefruit	28%
Valencias	36%
Midseason oranges	45%
Tangerines	74%

It is, of course, impossible to get any accurate figures at this early date because crops which, on the date the inspection was made, appeared to be gone may prove later to have been less severely effected, while in other instances a greater damage may show up later than was apparent at that time.

As in the case of the fruit, it is not possible at this time to tell to just what extent wood is damaged. In some instances it was severe but, taken as a whole, it apparently is not going to be great.

When a ctirus trees is in a thrifty, growing condition, low temperatures cause the bark to split and it is not nearly so difficult to determine the extent of the damage as it is where

the trees are dormant. It is not necessary for the bark on a tree to be split in order for it to be killed. Likewise because the bark of a tree is split, does not mean that it is always killed, but it is usually economy to replace it, especially if it is a young tree.

The question arises, of course, as to what extent the crop for 1935-36 will be affected. Undoubtedly where there is wood damage, the crop will be materially reduced but it is humanly impossible at this time to give an idea with any degree of accuracy as to what extent it may be effected. A great deal depends on weather conditions from this time until spring. It is generally believed that those properties not affected will produce fully as heavy or heavier crops because of the low temperature, whereas those receiving some wood damage will be greatly lessened.

It would seem desirable at this time to make certain suggestions with reference to procedure to be followed during the next six weeks or two months. Pruning at this time is not desirable. This operation should be delayed until the spring growth starts, enabling one to determine how much wood should be taken out. Likewise it would seem desirable to delay fertilization on those groves which have been damaged because of the danger of stimulating growth and increasing the possibility of further damage should another cold occur later on in the winter. Likewise cultivation should be delayed until the last of January or first of February.

On those groves suffering no damage and in well protected places, there is little need for changing normal operations.

While the damage has been severe, the industry as a whole has no doubt been benefitted, although unfortunately some individuals have suffered loss almost beyond repair.

NITRATE AGENCIES CO.,
By W. H. Klee, Manager

The writer has generally made it a practice to keep far from making prognostications which invariably are poor guesses.

In the matter of the recent freeze and from a careful check up which the writer has made in going about the State since Tuesday, the 11th, he believes that any estimate today of the damage to citrus will be purely a guess, which may prove decidedly different from conditions which will develop. There are a number of factors which appear to us to be significant and worth considerable thought on the part of any one connected with the industry.

One, the damage will be considerably lessened if penetrating rains but not soaking rains are general over the citrus belt within the next two or three weeks.

Two, if we are visited by another frost or freeze prior to rains, there is great danger of not only the fruit being ruined but also the trees.

Three, with proper rainfall and no freeze, we hazard a guess that seedlings are not damaged to a greater extent than 25%, grapefruit not exceeding 30%, mid season fruit 40 to 50%, Valencias ???, tangerines are undoubtedly damaged considerably but judging from the number of trucks on the road a great deal of these tangerines are being marketed and probably at a higher price to the grower than he got last year.

Four, if immediate and stern but

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Ban Ordered On Shipment Of Frozen Fruit

COMMISSIONER OF AGRICULTURE MAYO DECLARES EMERGENCY EXISTS

Declaring that a state of emergency exists by reason of the recent freeze, Commissioner of Agriculture Mayo declared a ban on the shipment of frozen fruit and ordered all fruit inspectors to remain on the job for the inspection of all fruit shipments out of the state.

Ordering special inspectors of the state into the field to prevent further shipments of fruit damaged by the freeze, Commissioner Mayo warned all shippers against any attempt to market fruit unfit for human consumption, which might destroy the confidence of the consuming public. The order was issued after a personal visit to the citrus growing sections by the Commissioner.

Loss Undertermined

It is impossible at this time to determine the extent of the damage from the freeze but the damage, while heavy, has not destroyed the crop," Commissioner Mayo commented, "In order to protect the growers who are so fortunate as to have some good fruit left, I am requesting the full cooperation of the industry in keeping frozen fruit off the market so good fruit may be sold to advantage and not be handicapped by fruit unfit for human consumption."

Further warning that fruit slipped past State inspectors will be liable to confiscation at Eastern markets by inspectors enforcing Pure Food Regulations of the U. S. Department of Agriculture was also sounded. Despite warning of the leaders of the industry, certain shippers in the state worked overtime this week to rush frozen fruit to markets already oversupplied with Florida fruit, according to reports. These shipments which will remain edible only for a limited time were particularly cited by Commissioner Mayo as harmful to the entire industry.

Declares Emergency

The ban on shipment of frozen fruit to be made effective through the statewide inspection started Monday, December 17, was declared by Commissioner Mayo after need for an emergency measure became apparent. Numerous applications and complaints had been received from representative groups of the industry, including a terse summary of the situation wired to Tallahassee by C. C. Commander, general manager of the Florida Citrus Exchange.

"Our reasons for the request are as follows:" Mr. Commander stated. "First, considerable portion of the citrus fruits of this state are now in a damaged condition because of the recent frost and freeze; second, large quantities of this questionable citrus are now being prepared and shipped to market; third, the markets of the nation have already been oversuppplied with citrus; fourth, a serious handicap to grower income will evidently result through loss of trade confidence when this damaged fruit reaches the market."

"Science has shown us how to produce, now it must show us how to distribute what we produce. To production science we must add economic science without for a moment ceasing to advance the former." — Hon. Henry A. Wallace.

Foreign Citrus Movements

CUBAN GRAPEFRUIT EXPORTS —1934

By American Consul, Harold S. Tewell, Habana, Cuba

Exports of grapefruit from the Isle of Pines, Cuba, in 1934 (July 15 to October 31) amounted to 184,-742 crates, as compared with 76,976 crates in 1933, and 183,846 crates in 1932. Details of the trade are as follows: (in crates)

Year to 1934: United States, 709,-961; United Kingdom, 65,662; Germany, 412; France, 89; Netherlands, 130; Canada, 8,448; Total, 184,742.

Year to 1933: United States, 34,-428; United Kingdom, 40,217; German, 2,580; France 88; Netherlands, (none); Canada, 1,663; Total 76,976.

Crop damage by hurricane was entirely responsible for the decline in grapefruit exports from the Isle of Pines in 1933, and it will be noted that shipments in 1932 were only slightly less than those during the season just closing. Excessive rainfall in 1934, however, retarded ripening and harvesting. It is estimated that about 25,000 crates remain in the hands of the growers, which will be shipped in bulk to Cuban markets.

Market Conditions

Practically all shipments to the American market went forward before the last of September, on which date the seasonal preferential tariff on Cuban grapefruit ceased to be effective. However, inasmuch as about half the exports to the United States were made before the seasonal preferential tariff became effective on Septembr 3, the full benefit of that measure was not realized this year by grapefruit growers.

All shipments to the United States were made on a consignment basis, New York handling the bulk of the trade, although quantities were shipped to New Orleans, St. Louis, Chicago, and Cincinnati. The average gross price reported to have been received varied from $2.50 to $4 per crate, depending upon sizes of the fruit.

AUSTRALIAN CITRUS FRUITS

By Assistant Trade Commissioner, Wilson C. Flake, Sydney, Australia

According to figures supplied by the Commonwealth Department of Commerce, exports of Australian oranges from January to September, 1934, amounted to 233,283 cases, or nearly 55,000 cases in advance of last year's total, which was 178,950 cases. The increase is chiefly accounted for in heavier shipments to Great Britain, mostly through the ports of London and Liverpool. Shipments to Canada also increased. It is expected that shipments to New Zealand will have increased by the end of the season. Shipments to New Zealand during the first nine months of 1934 amounted to 60,560 cases, compared with 81,892 cases during the entire year 1933. New South Wales and South Australia were the principal sources of exports.

Quality of Oranges Disappointing

Although increased shipments of oranges have been made to Great Britain from Australia this year, many of those from New South Wales have not been satisfactory and have brought poor prices. Those from South Australia have been of good quality.

Government Assistance

As a result of the closing of the New Zealand market to Australia citrus fruit, the Australian Federal Government in 1933 inaugurated the experiment of subsidizing shipments to London, in the hope of making a market there. Shipments were carefully selected and scientifically treated on shipboard. An expert sent to London reported that they arrived in good condition. This year the Federal Ministry again guaranteed growers against loss through export up to 13s. a case. However, there have been complaints about the condition in which the fruit reached London this year, and it is thought that consideration may be given to legislative action to strengthen the powers of the Australian Department of Commerce to remove a defective consignment from the vessel carrying it.

New Zealand Embargo

It is expected that the New Zealand embargo on Australian citrus fruit may be lifted in time for the next citrus season.

BRAZILIAN ORANGE EXPORTS DECLINE

By Assistant Trade Commissioner, Aldene A. Barrington, Rio de Janeiro, Brazil

The quantity of oranges exported from Brazil during the eight months of 1934 amounted to 1,452,231 boxes, or a decline of 11 percent from the 1, 615,402 boxes shipped in the similar period of 1933. Owing to the higher prices this year, however, the value of these exports showed a

slight increase. The decrease in exports may be atributed to the poor orange crop in both Rio de Janeiro and Sao Paulo.

SPANISH CITRUS FRUIT EXPORTS

By American Assistant Trade Commissioner, Miles Hammond, Madrid, Spain

Moved by continued complaints by importers in the London market in regard to the poor quality of Spanish citrus products received there, the Spanish government has laid down rules and regulations governing the grade, including size and quality, and the procedure to be followed in exporting citrus products to Spain; the color, degree of ripeness of the fruit, size, packages and packing. All fruit destined for foreign markets must be subjected to Government inspection.

Detailed information regarding these regulations may be obtained from the Bureau of Foreign and Domestic Commerce upon request.

JAPANESE ORANGE GROWERS SHARE EXPORT MONOPOLY PRIVILEGE

By Consul General, Arthur Garrels, Tokyo, Japan

On October 19 the Japanese Government authorized the Orange Growers Association to export one-half of the total quantity of oranges permited to be shipped to the United States, thereby granting it one-half the monopoly heretofore held by the Orange Exporters Association. Since 1924 the shipment of oranges to the United States has been under the sole control of the Japanese Orange Exporters Association, in accordance with the desire of the Government to regulate such exports. The granting of the monopoly privilege in part to the Growers Association has been made notwithstanding commitments made by the Exporters Association of the entire 1934 crop to Pacific Coast importers. Those commitments will now be required to be halved.

Sudden change in temperature cause wool garments to shrink. In washing wool garments, wash and rinse in warm water and hang in a warm room to dry.

FLORIDA CITRUS CROP HIT HARD BY THE FREEZE

(Continued from page 21.)

fair methods of inspection are carried out to see that no frozen fruit is shipped, we guess that there will be a greater net return to the grower for the 1934-35 crop than any reasonable business man might have expected for the crop prior to the freeze.

P. S. — We purposely left the Valencia damage blank because our reports have been so conflicting that we would even hesitate to make a guess. Personally the writer believes that Valencias, except those in very low places and those exposed to the South sun, will come through okay.

FLORIDA CITRUS INSTITUTE TO BOOST CITRUS SALES

(Continued from page 9.)

Brown, a former mayor of DeLand and manager of the Florida exhibit at the 1933 and 1934 Chicago fairs. An advisory committee will be formed consisting of a representative each from the Citrus Growers and Shippers Association, the Committee of Fifty, the Florida Citrus Exchange group and the state horticultural society. All members of both committees will serve without compensation.

Chemist Studies Possibility Of Cannery Waste

The possibility of converting waste from citrus canning plants of Florida into valuable commercial products is being given serious and careful study by Mr. Edward T. Keenan of the Soil Laboratories at Frostproof in connection with the Florida Fruit Canners of the same place.

At the present time Mr. Kennan is engaged in experiments with naringin, a product made from the unedible portions of grapefruit and oranges. This product is designed for use in the manufacture of marmalades from sweet oranges and in the preparation of various synthetic beverages.

Parke Davis and the Abbott Laboratories also are experimenting with the product for medicinal possibilities and various federal departments are carrying on experiments to determine its availability for varied uses, while the McGraw-Hill Company is experimenting with the product to determine its worth in bookbinding to protect valuable bindings from the encroachment of roaches and other vermin.

Mr. Keenan, who has been working on the process for the past two years, is now engaged in working on a six-ton lot of waste from which he expects to produce about one hundred pounds of naringin. The amount of waste required to produce a given amount of naringin varies greatly with the season of the year, running from ten tons to one hundred tons for 100 pounds of product. As the average canning plant runs from 3000 to 4000 tons of waste per season and the largest plants run not more than 10000 to 12000 tons, it will be seen that the volume of naringen produced, even if all available waste should be used, would be very limited. However, since the product has a commercial value of $6 per pound in large lots, it will be seen that the aggregate value would be very considerable, and would afford a profitable outlet for otherwise worthless waste.

Besides the naringin, Mr. Keenan states that the cannery waste is rich in vitamin "C", pectin, indolin and other valuable elements, and he is now carrying on experiments to determine the possibilities of producing these elements on a profitable basis.

Mr. Keenan is now preparing to send out his first large shipment—that is, large in value, though small in volume, and he is anxiously awaiting reports of the results of its introduction to the trade in commercial qualities. He is of the opinion that its largest sale would necessarily come from the British Isles and other European countries where marmalades are more popular than in America.

Where normal amounts of fertilizers are applied, soil types exert no marked influence on the composition of truck crops, say chemists at the Florida Agricultural Experiment Station.

CLASSIFIED ADVERTISEMENTS

PERSONAL

QUIT TOBACCO easily, inexpensively, without drugs. Send address. N. A. Stokes, Mohawk, Florida.

THRIFTY TREES and budwood from record performance Perrine Lemon parents, Persian Lime and other citrus varieties. DeSoto Nurseries, DeSoto City, Fla.

UP to $20.00 paid for Indian Head Cents; Half Cents $125.00; Large Copper Cents $500.00, etc. Send dime for list. Romancoinshop, D. Springfield, Mass.

WANTED: — Good second hand double orange sizer, which will run two cars. Christian & Neal, McIntosh, Fla.

SPERRYOLA LEMON TREES
—A hardy, commercial lemon, maturing on trees after the second year. Literature on request. Propagated only by HARDIN NURSERIES, Lakeland, Fla., P. O. Box 63.

FOR SALE—Selected budwood and trees of Perrine Lemon, Tahiti Lime, new varieties Tangelos and other Citrus. Ward's Nursery, Avon Park, Florida.

MEN WANTED—Sell Shirts. No experience necessary. Free samples. Commission in advance. Free ties with shirts. Carroll Mills, 875A Flatbush Av., Brooklyn N. Y.

CLEOPATRA Mandarin root-stock, liningout size and larger. Also sour orange. Variety of buds on Cleo. Grand Island Nurseries, Eustis, Fla.

PUREBRED PULLETS FOR SALE—White Leghorns and Anconas ready to ship. Barred Rocks and R. I. Reds shortly. Several hundred yearling White Leghorn hens now laying 70%. Write or wire for prices. C. A. Norman, Dr. 1440, Knoxville, Tenn.

WANTED—To hear from owner having good farm for sale. Cash price, particulars, John Black, Chippewa Falls, Wisconsin.

LAREDO SOY BEANS, considered free from nematode, excellent for hay and soil improvement. Write the Baldwin County Seed Growers Association, Loxley, Alabama, for prices.

FANCY ABAKKA pineapple plants. R. A. Saeger, Ankona, Florida.

FOR SALE—Selected budwood and trees of Perrine lemon, Tahiti lime, new varieties tangeloes and other citrus. Ward's Nursery, Avon Park, Fla.

DETAILED SOIL Analysis, Interpretations. $2.50. Soil Laboratory, Frostproof, Florida.

SCENIC HIGHWAY NURSERIES has a large stock of early and late grapefruit and oranges. One, two and three year buds. This nursery has been operated since 1885 by G. H. Gibbons, Waverly, Fla.

NEW COMMERCIAL lemon for Florida, the Perrine; proven. All residents need yard trees, keeping Florida money at home. Booking orders for budded stock for Winter delivery. DeSoto Nurseries, DeSoto City, Fla.

WANTED—To hear from owner of land for sale. O. Hawley, Baldwin, Wis.

SATSUMA BUDWOOD from Bearing Trees. Hills Fruit Farm, Panama City, Fla.

SEED—Rough lemon, sour orange, cleopatra. New crop from type true parent trees. Also thrifty seedlings. DeSoto Nurseries, De Soto City, Florida.

BUDDED trees new Florida commercial lemon, proven, thin skinned, juicy, scab immune. Also rough lemon, sour orange and Cleopatra seed and liningout seedlings. DeSoto Nurseries, DeSoto City, Fla.

SEEDS—ROUGH LEMON, SOUR ORANGE, CLEOPATRA. Pure, fresh, good germination. Also seedlings lineout size. De Soto Nurseries, DeSoto City, Fla.

CROTALARIA SPECTABILIS—Seed for sale. New crop, well cured, bright and clean. Price 25c per pound in 100 pound lots and over, 30c per pound in less quantities, f. o. b. Hastings, Bunnell, Lowell and San Antonio, Florida. F. M. LEONARD & COMPANY, Hastings, Florida.

WANTED—Position as packing house foreman: in citrus business twenty-five years; ten years' experience as foreman; married man. J. R. Henry, Okahumpka, Florida.